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2,704,657

APPARATUS FOR COOLING LIQUIDS

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FIG. 1.

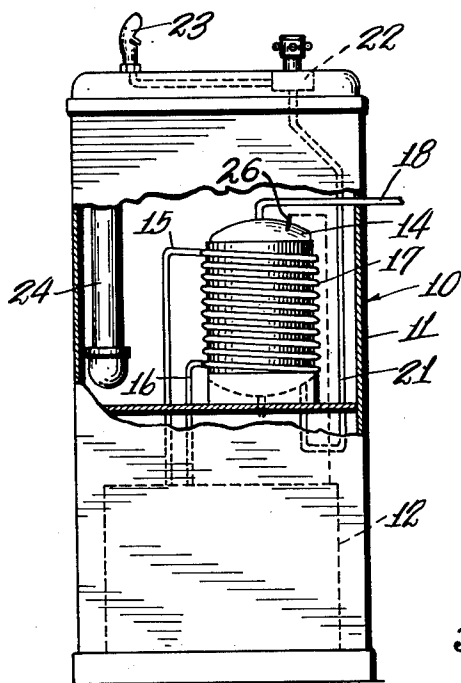


FIG. 2.

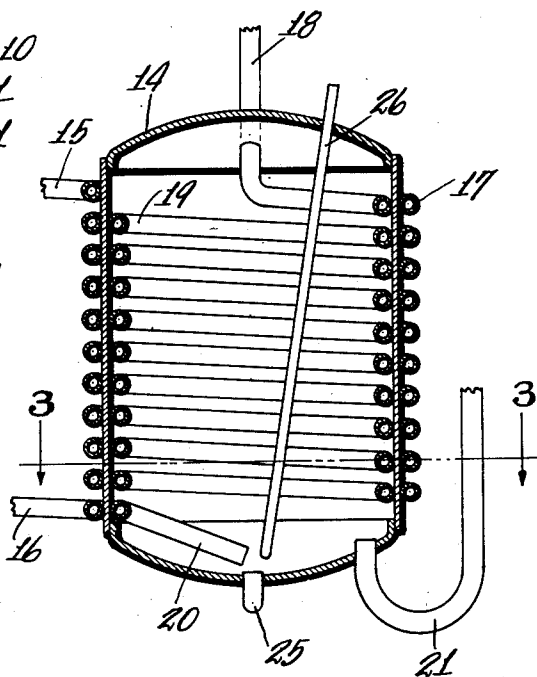
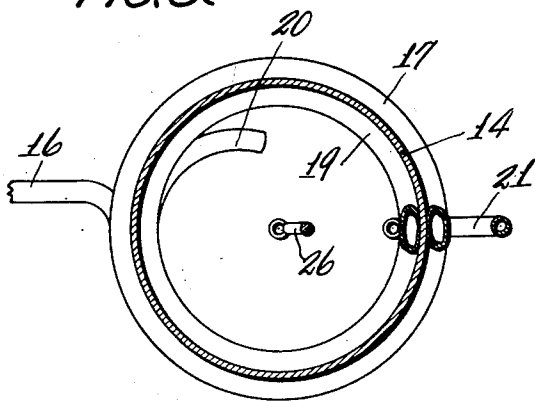


FIG. 3.



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APPARATUS FOR COOLING LIQUIDS

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1 Claim. (Cl. 257—241)

My invention relates to apparatus for cooling liquids, more particularly to water drinking fountains of the refrigerator type, and the principal object of my invention is to provide new and improved apparatus of this character.

Many prior attempts have been made to introduce inlet water to the storage tank of a drinking fountain in a manner to obtain maximum heat transfer relationship between the water in the storage tank and the refrigerant for cooling such water. My invention provides means for securing an optimum of heat transfer in an efficient and economical manner.

In the drawing accompanying this specification and forming a part of this application, there is shown, for purposes of illustration, an embodiment which my invention may assume, and in this drawing:

Figure 1 is a side elevational view of a water drinking fountain, portions being broken away to disclose detail.

Figure 2 is an enlarged longitudinal sectional view taken through the water storage tank, and

Figure 3 is a sectional view corresponding generally to the line 3—3 of Figure 2.

Referring to the drawing, an embodiment of my invention is herein disclosed for use with a refrigerator-type water cooler 10, comprising a casing 11, the lower end of which encloses a motor-compressor-condenser unit 12 which may be of any suitable type and therefore need not be shown or described in detail. A water storage tank 14 is supported in the upper portion of the casing 11 in any desired manner.

Suitably connected to the unit 12, as by means of conduits 15 and 16, is a refrigerant-carrying coil 17, and this coil is wound about the tank 14 with its convolutions in close contact with the exterior surface of the tank. In the presently disclosed embodiment, the conduit 16 represents the inlet line for the refrigerant while the conduit 15 represents the suction line for return to the unit 12.

A conduit 18 leads from a suitable source of water supply and enters the tank at an upper portion thereof, as best seen in Figure 2. The conduit 18 is extended to within the tank 14 and the interior portion is preferably provided as a coil 19, the convolutions of which are in close contact with the inner wall surface of the tank 14. The lower end 20 of the coil is open and curled toward the center of the tank, as seen in Figure 3, so that inlet water is delivered to the lower end of the tank.

A conduit 21 has communication with the lower end of the tank 14, and leads to the usual hand-operated valve

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22 which controls flow of drinking water to a bubbler 23 in the customary manner. Unconsumed portions of water are led to a drain through a suitable drain pipe 24.

To further insure good heat transfer relationship between the coils 17, 19 and the tank 14, the storage tank assembly is preferably hot tin dipped inside and outside prior to final assembly. Thus, the refrigerant coil 17 and the water coil 19 are held in intimate and conducting contact with the relatively thin wall of the tank 14 and maximum heat transfer is effected. It will be appreciated that the coil 19 causes the water to flow in an enclosed spiral path in close proximity to the relatively cold wall of the tank 14 and therefore inlet water is efficiently cooled as it enters the tank proper.

The lower end of the tank 14 is provided with a conduit 25 which may lead to a remote fountain water outlet, or which may be used as a drain for the tank. A thermostat bulb well 26 is shown in position within the tank, this well being adapted to contain a thermostat device for controlling operation of the unit 12.

In view of the foregoing it will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention and it will also be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described, hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

A drinking fountain of the refrigerator type, comprising a vertically disposed substantially cylindrical storage tank for holding water to be cooled, a refrigerant pipe helically coiled about the exterior wall surface of said tank in direct contact therewith, a water passage pipe disposed within and helically coiled about the interior wall surface of said tank in direct contact therewith, the convolutions of said helically coiled water passage pipe being in substantial alignment with the adjacent convolutions of said refrigerant pipe and being submerged in the tank contents in direct contact therewith, the upper end of said water passage pipe being directly connected with an exterior source of water to be cooled in said tank, the lower end of said water passage pipe opening into the bottom portion of the tank, means for circulating a fluid refrigerant upwardly through said refrigerant pipe to progressively cool said tank wall and the tank contents, means for circulating water downwardly through said water passage pipe to progressively cool the water prior to its admission into the bottom portion of the tank, and a valve controlled conduit for conducting the cooled water under liquid pressure from said tank bottom portion to said drinking fountain.

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